

REMARKS

Claims 1-18 are pending in the present patent application. Claims 1, 2, 6-9, 11, 12, and 18 stand rejected; and claims 3-5, 10, and 13-17 stand objected to. By this amendment, claim 2 has been amended. This application continues to include claims 1-18.

The Examiner has objected to claims 3-5, 10, and 13-17 as being dependent upon a rejected base claim, but has indicated that claims 3-5, 10, and 13-17 contain allowable subject matter, and would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for the indication of allowability regarding claims 3-5, 10, and 13-17. However, in view of Applicant's response to the rejection of claims 1 and 11, set forth below, Applicant respectfully requests that the objection to claims 3-5, 10, and 13-17 be withdrawn.

Claim 2 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

In particular claim 2 was rejected for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural components, based on MPEP §2172.01. The Examiner has indicated that the omitted structural cooperative relationships are: the specific structural relationship between the sense surface of the print media detection device, the slot of the mid-frame and the media support, which allows the sense surface to be positioned in or not positioned in the slot, based upon the presence of print media.

The Examiner has requested further clarification of the structure in claim 2.

In accordance with the Examiner's request, and to expedite prosecution of the present application, Applicant has amended claim 2 to provide additional clarification.

Amended claim 2 is directed to the imaging apparatus of claim 1, and recites wherein said print media detection device is configured such that when said print media is present at said print media support, said sense surface is not positioned in said slot of said mid-frame for detection by said sensor, and wherein if said print media is not present at said print media support, said sense surface is positioned in said slot of said mid-frame for detection by said sensor.

Accordingly, the structural relationship between the between the sense surface of the print media detection device, the slot of the mid-frame and the media support is clarified. For example, print media detection device is configured such that when the print media is present at the print media support, the sense surface is not positioned in the slot of the mid-frame for detection by the sensor, and wherein if the print media is not present at the print media support, the sense surface is positioned in the slot of the mid-frame for detection by the sensor, as recited in claim 2.

Thus, for at least the reasons set forth above, Applicant respectfully submits that claim 2 is definite, and does particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claims 1, 8, and 9 were rejected under 35 U.S.C. §102(e) as being anticipated by Bolash, et al., U.S. Patent Application Publication No. 2004/0135106 A1 (hereinafter, Bolash). Applicant respectfully requests reconsideration of the rejection of claims 1, 8, and 9 in view of the following.

Bolash is directed to a media sensing system and method that can reliably distinguish between media types (page 1, paragraph 0009). Bolash discloses an ink jet printer 10 that includes a printhead carrier system 12, a feed roller unit 14, a media sensor assembly 16, a controller 18, a mid-frame 20 and a media source 22 (page 2, paragraph 0026). Printhead carrier system 12 includes printhead carrier 24 (page 3, paragraph 28) that is guided by a pair of guide members 34, each of which may be, for example, a guide rod or a guide rail (page 3, paragraph 0029).

Controller 18 executes instructions to conduct media sensing, such as detecting the presence or absence of the print media sheet 23, or the determination of media type, based on information received from media sensor assembly 16 (page 3, paragraph 0033). Media sensor 80 includes a light source 122 and a specular (light) detector 124 (page 4, paragraph 0040), and during operation, light source 122 generates a light beam that impinges print media sheet 23 thereby generating reflected light, which has a light intensity that is related to the voltage level of output signal V_{out} and is related to a type of print media sheet 23, e.g., plain paper, photo paper, coated paper, transparency (page 4, paragraph 49). Light detector 124 detects the light intensity of the reflected light, and generates a detection voltage V_{det} based on the light intensity (page 4, paragraph 0050).

Applicant believes that claims 1, 8, and 9 patentably define Applicant's invention over Bolash for at least the reasons set forth below.

Claim 1 is directed to an imaging apparatus. Claim 1 recites, in part, a mid-frame having a slot formed along said scanning path.

The Examiner asserts that Bolash discloses a mid-frame having a slot formed along the scanning path, relying on Bolash elements 34. However, Bolash elements 34 are not the

Bolash mid-frame, but rather, are guide members 34, each of which may be, for example, a guide rod or a guide rail (page 3, paragraph 0029). For example, the Bolash mid-frame is identified in the Bolash disclosure with reference character “20,” such as that depicted in Fig. 2 (see paragraph 0026).

Although Bolash Fig. 1 depicts a space between guide members 34, which is asserted to be a “slot,” such space is not a slot within the context of Applicant’s claimed invention. For example, the space between guide rails 34 is not disclosed, taught, or suggested by Bolash to be a narrow opening in a surface, such as may be referred to in the art as a “slot.”

In addition, the asserted “slot” is not formed in the Bolash mid-frame (element 20 – see Bolash Fig. 2; and page 2, paragraph 0026), but rather, pertains to a spacing between guide members 34, which are distinctly different components of the imaging apparatus than is the mid-frame 20.

Accordingly, Bolash does not disclose, teach, or suggest a mid-frame having a slot formed along the scanning path.

Claim 1 also recites a print media detection device positioned below the mid-frame, the print media detection device including a first end and a second end, the first end having a sense surface, wherein the sensor senses one of a presence and an absence of the sense surface in the slot of the mid-frame as a determination of the depletion of the supply of print media at the print media support.

In contrast to a print media detection system positioned below the mid-frame, as recited in claim 1, the Bolash media sensor assembly 16 is clearly depicted above the Bolash mid-frame 20, and adjacent the Bolash media support 72. (See Bolash Fig. 2)

In addition, Bolash does not disclose, teach, or suggest wherein the sensor senses one of a presence and an absence of the sense surface in the slot of the mid-frame as a determination of the depletion of the supply of print media at the print media support.

Rather, Bolash discloses that media sensor 80 includes a light source 122 and a specular (light) detector 124 (page 4, paragraph 0040), and during operation, light source light source 122 generates a light beam that impinges print media sheet 23 thereby generating reflected light, which has a light intensity that is related to the voltage level of output signal V_{out} and is related to a type of print media sheet 23, e.g., plain paper, photo paper, coated paper, transparency (page 4, paragraph 49). Light detector 124 detects the light intensity of the reflected light, and generates a detection voltage V_{det} based on the light intensity (page 4, paragraph 0050).

Thus, rather than the sensor sensing one of a presence and an absence of a sense surface of the print media detection device in the slot of the mid-frame, as recited in claim 1, Bolash discloses sensing light that is reflected off the print media sheet 23.

Accordingly, Bolash does not disclose, teach, or suggest a print media detection device positioned below the mid-frame, the print media detection device including a first end and a second end, the first end having a sense surface, wherein the sensor senses one of a presence and an absence of the sense surface in the slot of the mid-frame as a determination of the depletion of the supply of print media at the print media support, as recited in claim 1.

Accordingly, for at least the reasons set forth above, Applicant respectfully submits that Bolash does not disclose, teach, or suggest the subject matter of claim 1. Claim 1 is thus believed allowable in its present form.

Claims 8 and 9 are believed allowable due to their dependence on otherwise allowable base claim 1. In addition, claims 8 and 9 further and patentably define the invention over Bolash.

Accordingly, for at least the reasons set forth above, Applicant respectfully submits that Bolash does not disclose, teach, or suggest the subject matter of claims 1, 8, and 9, and thus respectfully request that the rejection of claims 1, 8, and 9 under 35 U.S.C. 102(e) be withdrawn.

Claims 11, 12, and 18 were rejected under 35 U.S.C. §102(b) as being anticipated by Kwag, et al., U.S. Patent No. 5,897,112 (hereinafter, Kwag). Applicant respectfully requests reconsideration of the rejection of claims 11, 12, and 18 in view of the following.

Kwag is directed to a paper detection device for a paper tray that is inserted into an electrophotographic apparatus (col. 1, lines 18-20). Kwag discloses that a photo sensor 60 senses the exhaustion of paper in paper tray 200 based on the position of contact-sensing-structure 50 (col. 4, lines 16-18). Contact-sensing-structure 50 is constructed using sensor-activating-blade 51 that has a weighted portion 52 (col. 4, lines 46-47, Fig. 6).

The weighted portion (52) of sensor-activating-blade 51 rotates the sensor-activating-blade, shaft, and shaft connector around the pivotal connection between the shaft connector and the height-adjusting-beam (col. 4, lines 49-53). Rotation of the contact-sensing-structure causes photo sensor 60 to determine whether there is paper in the paper tray (col. 4, lines 53-55). A through hole 131 is formed in a portion of paper stand 130 at a position corresponding to the sensor-activating-blade's path of rotation, and allows the [weighted portion 52 of the] sensor-activating-blade to rotate through hole 131 when there is an absence of paper in the paper tray (col. 4, lines 55-59, Fig. 6), set forth as follows.

If there is no paper in paper tray 200, contact-sensing-structure 50 is rotated clockwise by the weight of the weighted portion 52, and simultaneously sensor-activating-blade 51 rotates between a light receiving element and a light emitting element of photo sensor 60, and weighted portion 52 passes through hole 131 in paper stand 130 (col. 5, lines 14-23). Then the photosensor sends a signal indicating to a controller (not shown) that the paper tray is empty (col. 5, lines 23-24).

Applicant believes that claims 11, 12, and 18 patentably define Applicant's invention over Bolash for at least the reasons set forth below.

Claim 11 is directed to method for performing print media depletion detection in an imaging apparatus. Claim 11 recites, in part, providing a mid-frame having a slot; providing a sensor locatable over said slot; and providing a print media support for holding a supply of print media.

In contrast to a mid-frame having a slot, Kwag discloses that a through hole 131 is formed in a portion of paper stand 130. A paper stand, such as paper stand 130 does not disclose, teach, or suggest a mid-frame of an imaging apparatus. Rather, such a paper stand is known in the art as that part of the paper tray that places the paper in position so that it may be fed into the imaging apparatus from the paper tray. For example, Kwag discloses as follows:

After a user inserts paper into the paper tray, paper tray 300 is inserted into the electrophotographic apparatus. The side of paper stand 310 that is along the edge at which the paper is picked up by the pickup roller is displaced in a direction away from the base of the paper tray. This brings the paper into contact with the pickup roller to allow the paper to be fed into the apparatus. (col. 3, lines 47-55).

Rather than a mid-frame, the Kwag paper stand 130 and paper tray 200 are more akin to a sort of removable print media support for holding a supply of print media, in that paper

stand 130 and paper tray 200 hold a supply of print media to provide paper to be fed into the Kwag apparatus.

Accordingly, Kwag does not disclose, teach, or suggest providing a mid-frame having a slot; providing a sensor locatable over said slot; and providing a print media support for holding a supply of print media, as recited in claim 11.

Claim 11 also recites providing a print media detection device having a sense surface; and detecting with said sensor one of a presence and an absence of said sense surface in said slot of said mid-frame as a determination of the depletion of said supply of print media at said print media support.

In contrast to detecting with the sensor one of a presence and an absence of the sense surface in the slot of the mid-frame as a determination of the depletion of the supply of print media at the print media support, Kwag discloses that if there is no paper in paper tray 200, contact-sensing-structure 50 is rotated clockwise by the weight of the weighted portion 52, and simultaneously sensor-activating-blade 51 rotates between a light receiving element and a light emitting element of photo sensor 60, and weighted portion 52 passes through hole 131 in paper stand 130 (col. 5, lines 14-23, Figs. 3, 6, and 7). Then the photosensor sends a signal indicating to a controller (not shown) that the paper tray is empty (col. 5, lines 23-24).

Thus, it is the Kwag weighted portion 52 that is present or absent from the asserted slot, Kwag through hole 131, depending upon the presence of print media. However, Kwag does not disclose, teach, or suggest detecting with a sensor one of a presence and an absence of weighted portion 52 in the asserted slot, through hole 131, as a determination of the depletion of the supply of print media at the print media support, as recited in claim 11.

Rather, any Kwag detection with a sensor is based on the opposite end of contact-sensing-structure 50, i.e., opposite from weighted portion 52, which rotates between a light receiving element and a light emitting element of photo sensor 60 (see Figs. 3, 6, and 7, which depict the upper portion of contact-sensing-structure 50 relative to photo sensor 60).

For example, from Figs. 3, 6, and 7, it is clear that it is the upper end of contact-sensing-structure 50, in the vicinity of reference character "50," that passes in proximity to photo sensor 60. Accordingly, it is this upper end of contact-sensing-structure 50 that is sensed by photo sensor 60, not the lower end, i.e., weighted portion 52, that passes into through hole 131 when there is an absence of paper.

Thus Kwag does not disclose, teach, or suggest detecting with the sensor one of a presence and an absence of the sense surface in the slot of the mid-frame as a determination of the depletion of the supply of print media at the print media support, as recited in claim 11.

Accordingly, for at least the reasons set forth above, Applicant respectfully submits that Kwag does not disclose, teach, or suggest the subject matter of claim 11. Claim 11 is thus believed allowable in its present form.

Claims 12 and 18 are believed allowable due to their dependence on otherwise allowable base claim 11. In addition, claims 12 and 18 further and patentably define the invention over Bolash.

For example, claim 12 is directed to the method of claim 11, wherein when said print media is present at said print media support, said sense surface is not positioned in said slot of said mid-frame, and wherein if said print media is not present at said print media support, said sense surface is positioned in said slot of said mid-frame for detection by said sensor.

For substantially the same reasons as set forth above with respect to claim 11, Kwag does not disclose, teach, or suggest a slot in the mid-frame, and does not disclose, teach, or suggest a sense surface that is or is not positioned in a slot of the mid-frame, much less wherein when the print media is present at the print media support, the sense surface is not positioned in the slot of the mid-frame, and wherein if the print media is not present at the print media support, the sense surface is positioned in the slot of the mid-frame for detection by the sensor.

Accordingly, claim 12 is believed allowable in its own right.

Accordingly, for at least the reasons set forth above, Applicant respectfully submits that Kwag does not disclose, teach, or suggest the subject matter of claims 11, 12, and 18, and thus respectfully requests that the rejection of claims 11, 12, and 18 under 35 U.S.C. 102(b) be withdrawn.

Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Bolash. Applicant respectfully requests reconsideration of the rejection of claim 7 in view of the following.

Bolash, et al., U.S. Patent Application Publication No. 2004/0135106 A1, issued as U.S. Patent No. 6,900,449 B2, is assigned to Lexmark International, Inc., of Lexington, KY, and the assignment was recorded at Reel/Frame 013985/0050 on 4/18/03. In addition, the present application is assigned to the same Lexmark International, Inc. of Lexington, KY, and the assignment was recorded at Reel/Frame 014824/0975 on 12/3/03.

However, Bolash is not prior art under 35 U.S.C. §103(a) since Bolash qualifies as prior art only under one or more of subsections (e), (f), and (g) of 35 U.S.C. §102, and the subject matter of Bolash and the claimed invention were, at the time the claimed invention

was made, owned by the same person or subject to an obligation of assignment to the same person, namely, Lexmark International, Inc. (See 35 U.S.C. §103(c)(1)).

Applicant thus respectfully requests that the rejection of claim 7 under 35 U.S.C. 103(a) be withdrawn.

Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Bolash in view of Elgee, et al., U.S. Patent No. 6,206,594 (hereinafter, Elgee). Applicant respectfully requests reconsideration of the rejection of claim 6 in view of the following.

For substantially the same reasons as set forth above with respect to claim 7, Bolash is not qualifying prior art under 35 U.S.C. §103(a) in relation to the present application.

Accordingly, Applicant respectfully requests that the rejection of claim 6 be withdrawn.

In addition, notwithstanding the above, Elgee does not disclose, teach, or suggest the subject matter of claim 1, from which claim 6 depends, nor does the Examiner assert as much.

For example, claim 1 recites a sensor; a carrier system configured to transport said sensor along a scanning path; a mid-frame having a slot formed along said scanning path; a print media support for holding a supply of print media; and a print media detection device positioned below said mid-frame, said print media detection device including a first end and a second end, said first end having a sense surface, wherein said sensor senses one of a presence and an absence of said sense surface in said slot of said mid-frame as a determination of the depletion of said supply of print media at said print media support.

In contrast to claim 1, Elgee discloses a print media level sensor 118 that includes a print media stack follower 120 that is configured to contact a top 123 of a stack of print media 122 and remain in contact therewith as the height of the stack changes. The height

information is determined based on encoded data on print media stack follower 120 that is representative of various heights of stack of print media 122 (col. 6, lines 48-57).

Thus, the Elgee print media level sensor does not sense one of a presence and an absence of a sense surface in a slot of a mid-frame as a determination of the depletion of the supply of print media at the print media support, as recited in claim 1.

Accordingly, Elgee does not disclose, teach, or suggest the subject matter of claim 1, and thus, claim 6 is believed allowable due to its dependence on otherwise allowable base claim 1.

Accordingly, for at least the reasons set forth above, Applicant respectfully submits that Bolash is not qualifying prior art under 35 U.S.C. §103(a), and that Elgee does not disclose, teach, or suggest the subject matter of claim 6, depending from claim 1. Applicant thus respectfully requests that the rejection of claim 6 under 35 U.S.C. 103(a) be withdrawn.

For the foregoing reasons, Applicant submits that the pending claims are definite and do particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Moreover, Applicant submits that no combination of the allowable cited prior art references teaches, discloses or suggests the subject matter of the appended claims. The appended claims are therefore in condition for allowance, and Applicant respectfully requests withdrawal of all rejections and allowance of the claims.

In the event Applicant has overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicant hereby conditionally petitions therefor and authorizes that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (317) 894-0801.

Respectfully submitted,



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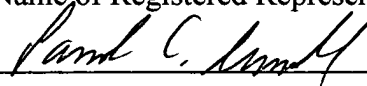
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